

FINAL CLOSE OUT REPORT
FIRESTONE TIRE AND RUBBER COMPANY SUPERFUND SITE
SALINAS, MONTEREY COUNTY, CALIFORNIA

I. INTRODUCTION

This Final Close Out Report documents that the U.S. Environmental Protection Agency (EPA) completed all response actions for the Firestone Tire and Rubber Company Superfund Site (Site) in accordance with *Close Out Procedures for National Priorities List Sites* (OSWER Directive 9320.2-09A-P).

II. SUMMARY OF SITE CONDITIONS

Site Background

The Firestone Tire and Rubber Company Superfund Site (Site) is a 256-acre parcel of land located at 340 El Camino Real South in the City of Salinas in Monterey County, California. The Site is surrounded by agricultural lands and is approximately six miles southeast of downtown Salinas. Much of the industry in the area consists of agriculture-related businesses.

The groundwater aquifer system in the area is comprised of three interconnected aquifers that are designated shallow, intermediate, and deep. Directly downgradient of the Site, groundwater in the intermediate and deep aquifers is used primarily for agricultural supply along with potential private domestic supply. Further downgradient, the City of Salinas relies on groundwater in the deep aquifer for municipal water supply.

Firestone Tire and Rubber Company (now Bridgestone/Firestone, Inc.) operated a tire manufacturing facility at the Site from 1963 to 1980. Firestone used a variety of chemicals and chemical formulations at the facility and has been identified as the sole potentially responsible party for the Site. EPA added the Site to the National Priorities List (NPL) on July 22, 1987.

Remedial Investigation

In March 1983, Firestone began investigations at the Site to comply with the closure requirements specified in the facility's Interim Status Document, under the Resource Conservation and Recovery Act (RCRA). The closure requirements were established by the Toxic Substances Control Division of the California Department of Health Services (DHS), predecessor to the California Department of Toxic Substances Control (DTSC), and the California Regional Water Quality Control Board (RWQCB). In July 1983, based on the

findings from the closure investigations, Firestone initiated onsite investigations to characterize the nature and extent of chemical releases to soil and groundwater. The following volatile organic compounds (VOCs) were detected in soil and/or groundwater at the Site: 1,1-dichloroethane (1,1-DCA), 1,2-dichloroethane (1,2-DCA), 1,1-dichloroethylene (1,1-DCE), 1,1,1-trichloroethane (1,1,1-TCA), trichloroethylene (TCE), perchloroethylene (PCE), benzene, ethylbenzene, toluene and xylene. Oil and grease were also detected in soils at the Site.

Firestone conducted interim remedial actions to address the contamination, including soil and tank removals with off-site disposal in a Class I landfill. On October 16, 1985, DHS issued a Remedial Action Order (RAO) to Firestone to address the groundwater contamination.

Eleven onsite areas were identified in 1983 as potential sources of contamination. Three areas were indoors and eight were outdoors. The indoor areas were cleaned and inspected for leakage and judged not to be potential sources of contamination. Investigation of the outdoor areas indicated VOC contamination in three areas. Remedial measures were recommended and implemented at these areas.

Groundwater in the aquifer system in the Site vicinity flows generally northwesterly. An extensive groundwater investigation was conducted at the Site and surrounding area, primarily downgradient of the Site. Onsite and offsite monitoring wells were installed to assess the horizontal and vertical extent of the groundwater contamination. Well surveys were conducted to locate all agricultural, municipal and domestic water wells within four miles downgradient of the Site.

Groundwater in the Site vicinity occurs in three interconnected aquifers, designated as shallow, intermediate, and deep aquifers. The shallow aquifer extends from ground surface to a depth of about 90 feet below ground surface (bgs). A partially continuous clay unit at a depth of about 60 feet bgs divides the shallow aquifer into two zones: upper and lower. The intermediate aquifer is about 40 feet thick and generally extends from 100 to 140 feet bgs. Further downgradient, the intermediate aquifer is thicker and extends to approximately 180 feet bgs. The deep aquifer system has four distinct zones at depths of about 200, 300, 400 and 500 feet bgs, which are extensively used for agricultural and some domestic purposes.

Groundwater samples were taken from monitoring and extraction wells installed during the investigation and existing agricultural, domestic, industrial, and municipal wells. Firestone installed a total of 181 monitoring and/or extraction wells and monitored 257 water supply wells. The results indicate that the contamination extended vertically into deep aquifers and laterally about three miles downgradient to the edge of the City of Salinas. The chemicals most commonly found in the groundwater were 1,1-DCA, 1,1-DCE and 1,1,1-TCA. 1,1-DCE was detected with the highest groundwater concentration of 400 parts per billion (ppb). The other chemicals were detected at lower concentrations or not detected at all in most wells.

Risk Assessment

In October 1988, Firestone prepared a Preliminary Risk Assessment which evaluated the following potential contaminant exposure pathways: direct contact with affected soil, inhalation of vapors from VOC-contaminated water, ingestion of water from surface water or groundwater sources and consumption of vegetables irrigated with affected groundwater. The risk assessment found that the hypothetical use of a domestic well placed in the maximum contamination point in the shallow aquifer presented potential human health risks. Based on the risk assessment results, the remedial objectives for the Site were the following: 1) control migration of chemicals from the shallow aquifer into the intermediate and deep aquifers where the water is used for agricultural and some domestic purposes; 2) maintain the quality of groundwater downgradient of the Site to ensure it is suitable for agricultural and domestic use; and 3) restore the quality of the shallow aquifer to meet the State drinking water standards or Maximum Contaminant Levels (MCLs). Human health risk-based concentrations were calculated for use of groundwater as drinking water. The risk-based groundwater concentrations were calculated using the carcinogenic risk criterion of 1×10^{-6} and the noncarcinogenic hazard index criterion of one. Groundwater cleanup action levels were established using the lower concentrations of the risk-based levels and the MCLs. DHS approved the Risk Assessment on March 1, 1989.

Removal Actions

Firestone conducted the following removal actions as interim remedial measures for the Site. In 1983, three outdoor areas (raw material storage, sludge-drying beds, and waste oil storage areas) were remediated. Underground and above ground storage tanks were cleaned and removed and the exposed soils were sampled for chemical contaminants. Based on the sampling results and visual inspections, contaminated soils were excavated and disposed of offsite. The contaminants remaining after the excavation were predominantly oil and grease, phthalates, and metals. Post-excavation sampling showed that: the oil and grease are not extractable; the metals are below background levels; and the phthalates are at very low levels. Approximately 65,000 cubic yards of contaminated soil and 9,000 gallons of hazardous liquids from the storage tanks were removed and disposed of at Class I hazardous waste disposal facilities. The areas were backfilled with clean soil and subsequently paved.

Pursuant to the RAO, Firestone constructed a groundwater extraction and treatment system in October 1986 to control VOC migration from the Site. The system included 15 onsite shallow aquifer extraction wells and an air stripper/carbon adsorption treatment plant. The system was expanded in 1987 by installing five offsite shallow aquifer extraction wells and modifying the treatment plant to accommodate the additional flow. The offsite wells were located about 1,400 to 1,700 feet downgradient of the Site and intercepted the contaminant plume before it reached the groundwater depression area where it could enter the intermediate aquifer. A pipeline was constructed to carry extracted groundwater from the five new extraction wells to the onsite treatment plant. The treatment plant was modified to increase the flow through the air stripper and bypass the activated carbon vessels with the clean air stripper effluent to increase the total capacity of the treatment plant.

Feasibility Study/Remedial Action Plan and Record of Decision

Firestone completed the final Remedial Investigation (RI) in December 1988 and completed the final Feasibility Study/Remedial Action Plan (FS/RAP) in August 1989. On September 6, 1989, DHS approved the RAP selecting the final Site remedy. On September 13, 1989, EPA issued a Record of Decision (ROD) Declaration that formally concurred with the remedy selected by DHS. The final remedy provided for remediation of groundwater onsite and offsite extending to a distance of over two miles from the Site and included the following major components:

- Pumping groundwater from the shallow 60-80 foot hydrogeological zone;
- Installing five new wells and pumping groundwater from the intermediate 120-180 foot hydrogeological zone;
- Treatment of extracted groundwater by air stripping and carbon adsorption under permit from the Monterey County Unified Air Pollution Control District;
- Discharge of treated water to Salinas River under a National Pollutant Discharge Elimination System (NPDES) permit from the RWQCB, Central Coast Region;
- Regular groundwater monitoring to ensure that the size of the contaminant plume is declining and to allow for adjustments to the extraction and treatment system;
- Crop testing to ensure no uptake of contaminants by plants; and
- A monitoring and contingency plan for currently uncontaminated water in the deep aquifer which could become contaminated and found not to be effectively remedied. The very limited contamination in the deep aquifer was expected to be inconsequential and to decrease to below the cleanup levels without direct remedial action.

There were no institutional controls required as part of the Site remedy.

Remedial Design

Under the RAO, an interim groundwater extraction and treatment system was constructed in 1986 and modified in 1987. The RAP/ROD required expanding the system to include five intermediate aquifer extraction wells. Firestone's consultant completed the engineering design for expansion of the system in August 1989. Bid packages for a pipeline extension to tie in additional extraction wells and treatment plant modifications were issued to seven qualified construction companies. Firestone awarded the contract which required installation of a 4,800-foot high density polyethylene conveyance pipeline and modifications of the treatment plant. The modifications included: connection of the existing onsite wells to an air stripper; upgrade of the air stripper influent and effluent piping; installation of well head level switches; installation of berms for untreated water containment; and installation of a purge water collection tank.

Remedial Construction Activities

As specified in the RAP/ROD, five offsite intermediate aquifer extraction wells were installed and connected to the existing treatment system in October 1989. Firestone retained a drilling contractor to install the five extraction wells in the intermediate aquifer. Work included drilling, installation, developing, logging, sampling and reporting all five wells in accordance with the approved Quality Assurance Project Plan (QAPP).

Throughput to the air stripper was limited by the Air District permit at 180 gallons per minute (gpm). After treatment plant modification, the air stripper flow rate was increased to 167 gpm and the carbon adsorption flow rates averaged 625 gpm (425 gpm from three intermediate aquifer wells and 200 gpm from five shallow onsite wells).

DHS approved the construction completion report on August 21, 1990. EPA completed the Interim Close Out Report on December 24, 1991. In June 1992, the groundwater cleanup levels were achieved in all extraction wells, and the groundwater extraction and treatment system was shut down.

Post-Remediation Activities

Subsequent to system shutdown, Firestone conducted an aquifer stability test in November 1992. Based on the results of the aquifer stability test, DTSC allowed the groundwater extraction and treatment system to remain shut down with continued groundwater monitoring until July 1995. Post-remediation monitoring of deep and intermediate aquifer wells showed no exceedances of the groundwater cleanup levels; however, monitoring of the shallow aquifer wells showed increases in contaminant concentrations to above cleanup levels in two wells located near the former Firestone facility. The two shallow aquifer wells (OW-4 and S-9) were screened in the upper zone of the shallow aquifer. The upper zone of the shallow aquifer is unsaturated for extended periods of time because it is above the normal groundwater table.

Since the residual contamination above the normal groundwater table was mainly a water quality issue, DTSC deferred the decision of case closure to the RWQCB. In 1998, Firestone conducted confirmation sampling that indicated that the residual contamination in the upper zone of the shallow aquifer had not impacted the intermediate and deep aquifers and that the contaminant concentrations in the two monitoring wells were decreasing. Based on these sampling results, RWQCB concluded that the residual contamination in the upper zone of the shallow aquifer would attenuate to below cleanup levels and would not impact the downgradient groundwater and deeper aquifers. With RWQCB's approval, Firestone dismantled the groundwater extraction and treatment system and properly abandoned all monitoring and extraction wells. On July 26, 2000, RWQCB closed the case and recommended that DTSC implement final case closure.

The groundwater cleanup levels in the RAP were set at MCLs based on the designated beneficial use of the aquifers in the area for drinking water. In June 2002, Firestone submitted a hydrogeologic evaluation of the upper zone of the shallow aquifer where the two monitoring

wells were screened. The evaluation concluded that the upper zone of the shallow aquifer is not suitable as a potential drinking water source because the zone is suspended over a silty clay aquitard and is often unsaturated for extended periods. In a March 5, 2003 letter, RWQCB concurred with Firestone's evaluation and concluded that the upper zone of the shallow aquifer appears to have no beneficial use based on the lack of groundwater. Therefore, MCLs do not apply to the upper zone of the shallow aquifer since this zone is not suitable as a drinking water source. Based on RWQCB's determination and the achievement of the cleanup levels in all other areas and zones, EPA concluded and DTSC concurred that the Site can be deleted from the NPL.

Community Relations Activities

In the late 1980's, when the Site was first listed on the NPL, the water supply was the object of considerable public interest in the City of Salinas. As a result, DHS's Community Relations Coordinator conducted an active campaign to ensure that the public and residents were well informed about Site activities. Community relations activities included: 1) preparation of a Community Relations Plan which included interviews of affected and/or interested individuals; 2) holding community/public meetings; and 3) publication of progress fact sheets or site updates.

The draft RAP and other site related documents were made available for 30-day public review from June 27, 1989 at the John Steinbeck Library in Salinas, California. The public meeting presenting the Site history, risk assessment results, and proposed remedial action was held on July 13, 1989 at the Salinas High School. DHS responses to comments were included in the final RAP.

Current Site Use

After shutting down the tire manufacturing operations, Firestone sold the Site in 1981. The Site has been redeveloped into an industrial park containing warehouses. The Salinas Group and the Operating Engineers Pension Trust Fund now jointly own the property.

III. DEMONSTRATION OF CLEANUP ACTIVITY QUALITY ASSURANCE AND QUALITY CONTROL

EPA and DTSC reviewed the remedial action contract and provided oversight of the construction to ensure compliance with quality assurance and quality control (QA/QC) protocols. Construction activities at the Site were determined to be consistent with the RAP/ROD and RD plans and specifications.

Firestone's construction contractor adhered to the approved construction quality control protocols. The construction quality assurance protocols incorporated all EPA and DTSC requirements. All confirmatory inspections, independent testing, audits, and evaluations of materials and workmanship were performed in accordance with the construction drawings, technical specifications and construction quality assurance protocols. Construction quality assurance was performed by an independent firm retained by Firestone. EPA, DTSC and

RWQCB representatives visited the Site during construction activities to review construction progress and evaluate and review the results of QA/QC activities. Deviation or non-adherence to QA/QC protocols, drawings, or specifications were properly documented and resolved.

The Quality Assurance Project Plan (QAPP) incorporated all EPA and DTSC QA/QC procedures and protocols. EPA analytical methods were used for all confirmation and monitoring samples during RA activities. Sampling of soil and groundwater followed the EPA protocol *Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods*. EPA and the State determined that analytical results are accurate to the degree needed to assure satisfactory execution of the remedial action.

IV. MONITORING RESULTS

An extensive geochemical database has been compiled for the Site from 1985 through 1998. The database summarizes analytical results from groundwater samples collected from 37 agricultural wells, 5 industrial wells, 20 municipal or domestic use water supply wells, 156 monitoring wells and 25 extraction wells. It contains about 38,000 analytical data points. Extraneous wells were eliminated from the monitoring program as the size and orientation of the groundwater impacts were defined.

The concentration of the groundwater contaminants declined rapidly in each of the extraction wells. Except for four onsite shallow extraction wells that exhibited the highest concentrations, all extraction wells achieved the groundwater cleanup levels within two years of extraction. The sampling results from all wells indicated cleanup levels were achieved in 1992. However, continued monitoring showed a slight increase in concentrations in the two upper shallow aquifer zone wells.

The Site closure report (Case Closure Summary, Former Firestone Facility, Salinas, California, IT Corporation, February 10, 1999) contains documentation of the complete results and accuracy of the groundwater sampling program.

V. SUMMARY OF OPERATION AND MAINTENANCE

The cleanup of the Site complies with the clean closure requirements consistent with the Resource Conservation and Recovery Act of 1976, as amended, 40 CFR section 264.111. All contaminated soils were removed to unrestricted land use standards in 1983. The groundwater extraction and treatment system was operated from 1986 until 1992 when monitoring results indicated that the cleanup levels were achieved. The system and all monitoring and extraction wells were dismantled and removed by 1998. Therefore, no additional operation and maintenance activities are required for the Site.

VI. SUMMARY OF REMEDIATION COSTS

The site cleanup was conducted by Firestone and its contractors. Firestone's total expenditures

for the project were approximately \$27.4 million. DTSC's total oversight cost for all site activities is estimated to be approximately \$464,000. EPA's total oversight cost for all site activities is estimated to be approximately \$178,000.

VII. PROTECTIVENESS

The Site meets all completion requirements as specified in OSWER Directive 9320.2-09-A-P, *Close Out Procedures for National Priorities List Sites*. Specifically, confirmatory groundwater sampling verifies that the Site has achieved the RAP cleanup levels and all necessary cleanup actions and requirements specified in the RAP/ROD have been implemented. A bibliography of all reports relevant to the completion of this Site under the Superfund program is attached.

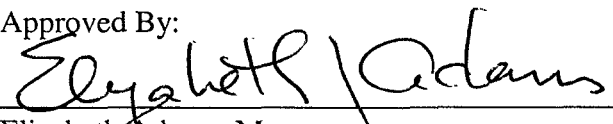
VIII. FIVE-YEAR REVIEW

EPA has conducted two five-year reviews for the Site pursuant to CERCLA section 121(c) and as provided in the guidance on Five Year Reviews [OSWER Directive 9355.7-02, *Structure and Components of Five-Year Reviews*, May 23, 1991, OSWER Directive 9355.702A, *Supplemental Five-Year Review Guidance*, July 26, 1994, and the *Second Supplemental Five Year Review Guidance*, December 21, 1995].

The first five-year review was completed on November 16, 1994 and concluded: 1) cleanup levels, when attained, would allow unlimited use and unrestricted exposure; 2) cleanup levels established for the remediation remained protective; 3) cleanup levels had been achieved in all extraction wells; and 4) 1,1-DCE concentrations in 2 of 41 monitoring wells were above State MCLs, but below Federal MCLs.

The second five year review was completed on September 28, 2001 and concluded that the very limited extent and very low concentrations of 1,1-DCE in shallow groundwater with no expected use did not constitute a significant risk to human health or the environment. Although additional shallow groundwater sampling was recommended, the RWQCB's subsequent determination that the upper zone of the shallow aquifer was not a drinking water source meant that no sampling was needed. Based on the RWQCB's determination that the affected shallow zone has no beneficial use and the achievement of the cleanup levels in all other areas and zones, further five-year reviews are no longer required for the Site.

Approved By:


Elizabeth Adams, Manager
Superfund Site Cleanup Branch

12/22/2004
Date

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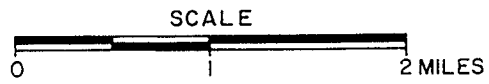
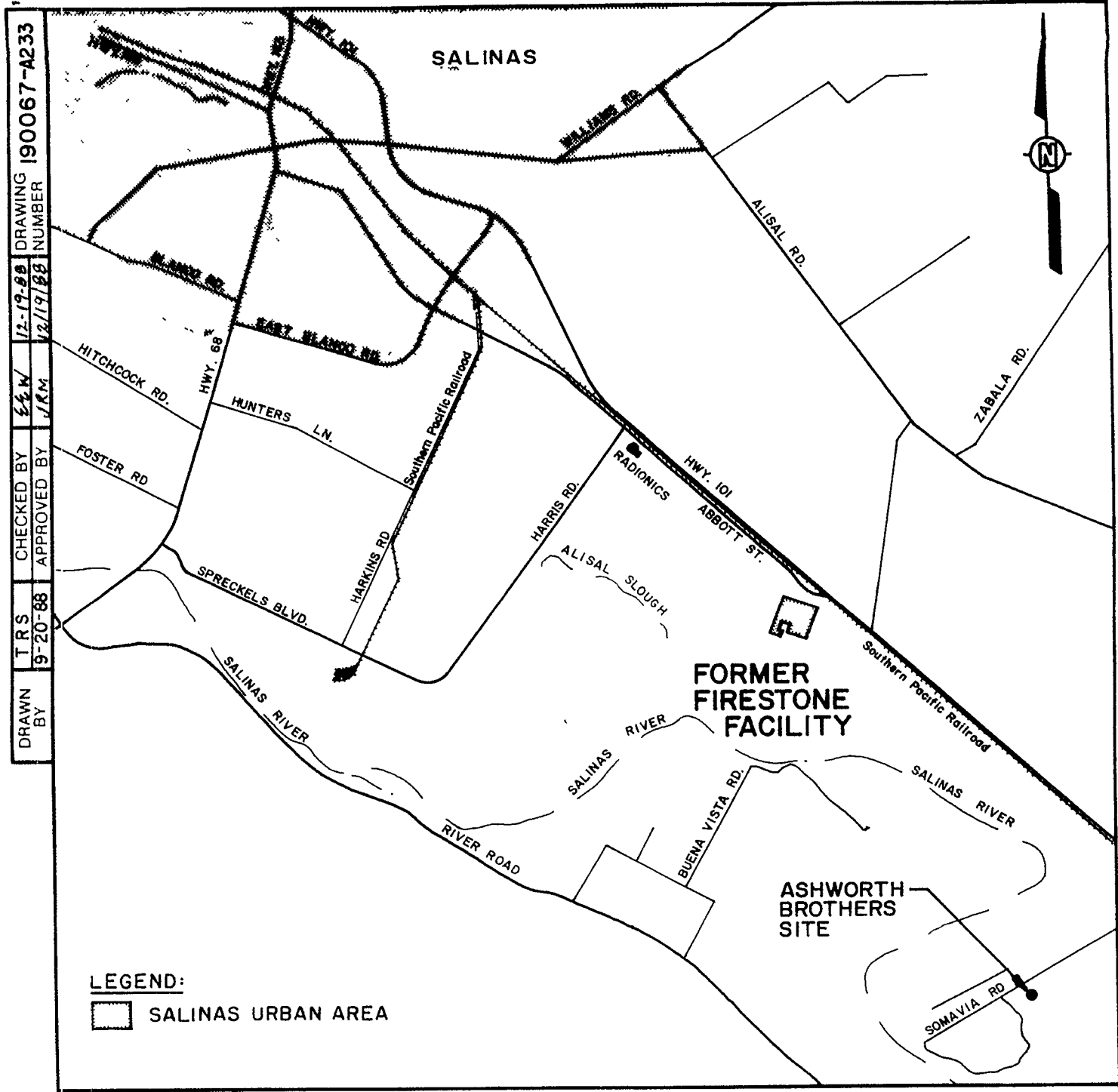
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 7.5 MIN. U.S.G.S TOPOGRAPHIC MAP OF CHULAR, NATIVIDAD, SALINAS & SPRECKELS, CALIFORNIA QUADRANGLES, DATED 1947, PHOTOREVISED 1968, 1984, 1975, 1984 RESPECTIVELY. SCALE: 1=24,000

FIGURE 1-1
VICINITY MAP
 FORMER FIRESTONE FACILITY
 SALINAS, CALIFORNIA
 PREPARED FOR
BRIDGESTONE/FIRESTONE INC.
NASHVILLE, TENNESSEE



... Creating a Safer Tomorrow

DRAWN BY: T.R.S. 9-20-88
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 DRAWING NUMBER: 190067-A233

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